

FIG. 1

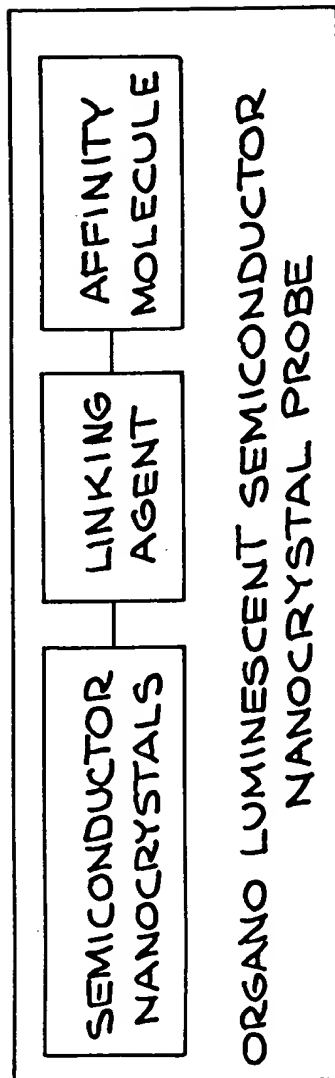


FIG. 2

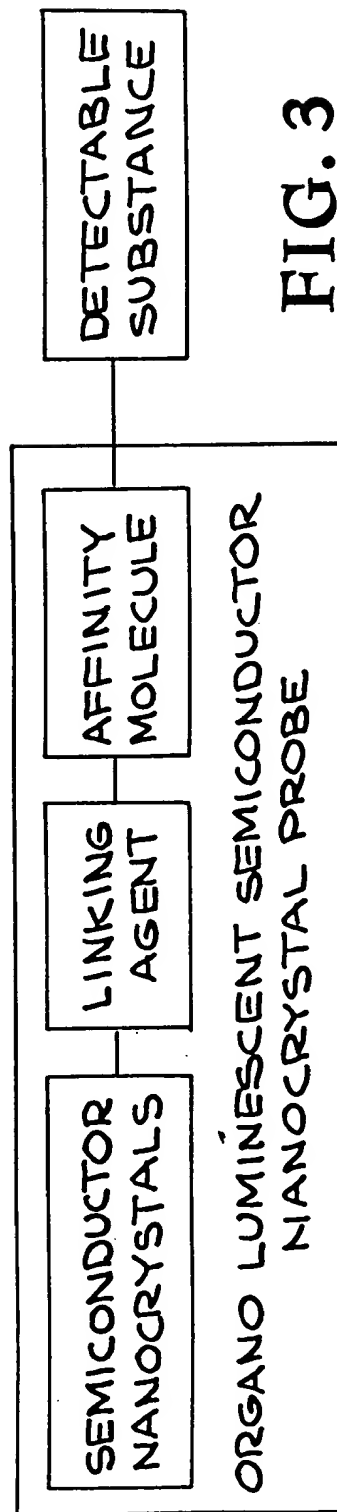


FIG. 3

LINKING TOGETHER A SEMICONDUCTOR  
NANOCRYSTAL CAPABLE OF EMITTING  
RADIATION IN A NARROW WAVELENGTH BAND  
AND  
ONE OR MORE LINKING AGENTS CAPABLE OF  
ALSO LINKING TO AN ORGANIC AFFINITY  
MOLECULE;

AND  
LINKING TOGETHER AN ORGANIC AFFINITY  
MOLECULE CAPABLE OF SELECTIVELY  
BONDING WITH A DETECTABLE SUBSTANCE  
AND  
THE ONE OR MORE LINKING AGENTS CAPABLE  
OF ALSO LINKING TO A SEMICONDUCTOR  
NANOCRYSTAL;

TO THEREBY FORM AN ORGANO LUMINESCENT  
SEMICONDUCTOR NANOCRYSTAL PROBE  
CAPABLE OF BONDING TO A DETECTABLE  
SUBSTANCE IN A MATERIAL AND, FOR  
EXAMPLE, TO EMIT RADIATION OF A NARROW  
WAVELENGTH BAND WHEN EXPOSED TO  
EXCITATION ENERGY TO INDICATE THE  
PRESENCE OF THE DETECTABLE SUBSTANCE

FIG. 4

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DETERMINING THE PRESENCE OF A  
DETECTABLE SUBSTANCE IN A BIOLOGICAL  
MATERIAL BY CONTACTING THE BIOLOGICAL  
MATERIAL WITH AN ORGANO LUMINESCENT  
SEMICONDUCTOR NANOCRYSTAL PROBE  
COMPRISING :

1. A SEMICONDUCTOR NANOCRYSTAL  
CAPABLE OF EMITTING, ABSORBING,  
SCATTERING, OR DIFFRACTING ENERGY IN A  
NARROW FREQUENCY BAND WHEN EXCITED;
2. AN AFFINITY MOLECULE CAPABLE OF  
BONDING TO THE DETECTABLE SUBSTANCE;  
AND
3. ONE OR MORE LINKING AGENTS CAPABLE  
OF LINKING TO BOTH THE SEMICONDUCTOR  
NANOCRYSTAL AND THE AFFINITY MOLECULE

REMOVING FROM THE BIOLOGICAL MATERIAL  
PORTIONS OF THE ORGANO LUMINESCENT  
SEMICONDUCTOR NANOCRYSTAL PROBE NOT  
BONDED TO THE DETECTABLE SUBSTANCE

EXPOSING THE BIOLOGICAL MATERIAL TO  
ENERGY CAPABLE OF EXCITING THE  
SEMICONDUCTOR NANOCRYSTAL IN ANY  
ORGANO-LUMINESCENT DETECTION  
COMPOUND PRESENT IN THE BIOLOGICAL  
MATERIAL TO EMIT, ABSORB, SCATTER OR  
DIFFRACT ENERGY

DETECTING ANY ENERGY EMITTED AND/OR  
ANY ABSORBED, AND/OR SCATTERED OR  
DIFFRACTED BY THE SEMICONDUCTOR  
NANOCRYSTAL INDICATING THE PRESENCE IN  
THE BIOLOGICAL MATERIAL OF ANY  
DETECTABLE SUBSTANCE BONDED TO THE  
ORGANO-LUMINESCENT DETECTION  
COMPOUND

FIG.5

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